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ABSTRACT

A study was conducted to measure the student outcomes of academic (university transfer) programs and identify the factors related to those outcomes. Six British Columbia (Canada) community colleges participated in the study by surveying 5,770 of their former students. The survey measured four student outcomes, and the analysis tested several factors (e.g., grade point averages, number of semesters attended, institution attended, involvement) for their potential effects on each outcome. The results reflect favorably on the quality of college academic programs, especially when controlled for the types of students served. The results confirmed much university-based research that student skill gain and satisfaction are affected positively by student involvement. The results also confirmed that comparative data, made possible by multi-college studies of this type, can help explain inter-college differences on student outcomes. Contains 12 references. (Author/KM)

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Measuring Academic Outcomes...
and identifying what influences them

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for Management Research, Policy Analysis, and Planning

This paper was presented at the Twenty-Ninth Annual Forum of the Association for Institutional Research held at the Omni Inner Harbor Hotel and the Lord Baltimore Hotel, Baltimore, Maryland, April 30 - May 3, 1989. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Teresa Karolewski
Chair and Editor
Forum Publications Editorial
Advisory Committee

ABSTRACT

This paper measures the student outcomes of academic (university transfer) programs and identifies the factors related to those outcomes. Six B.C. community colleges participated in the study by surveying 5,770 of their former students. The survey measured four student outcomes. The analysis tested several factors (eg. Grade Point Averages, number of semesters attended, institution attended, involvement) for their potential effects on each outcome. The results reflect favourably on the quality of college academic programs, especially when controlled for the types of students served. The results confirmed much university-based research that student skill gain and satisfaction are affected positively by student involvement. The results also confirmed that comparative data, made possible by multi-college studies of this type, can help explain inter-college differences in student outcomes.

This paper measures four academic program outcomes -- post-college transfer rates, students' employability, students' skill gains, and students' perceptions of how valuable their academic studies were to them. It also identifies what factors predict each outcome. The results highlight the uses of outcomes data in identifying ways to improve academic programs, and the added value of collaborating with other colleges to assemble comparative data.

Background:

This paper is based on the results of a follow-up survey of community college students who completed some academic courses. This survey research was part of a continuing project to develop a model for British Columbia colleges to use in evaluating their academic programs. A Working Group of Academic Deans, Faculty and Institutional Researchers (among others) guided the project, under the auspices of the provincial committee of Academic Deans. The Group's model calls for student outcomes to be assessed as part of each college's academic program review. The Group conducted some initial pilot-tests in 1987. This paper uses data from the pilot-test done in 1988.

Relevant Literature:

Astin (1985) and Pace (1984) identify factors which influence the quality of academic education. These include various measures of student involvement in the learning process, the quality of student effort, the teaching skills of faculty, and the sense of community in a College. Friedlander (1982) reports that the more academic courses students take, the more confident they are in their abilities to speak and write effectively. Terenzini (1987) reports that students who most engaged in the learning process in the first two years of College achieve higher levels of skill development and personal growth in their later years at college. Astin (1977), Wood and Wilson (1972), and Pascarella and Terenzini (1976) further comment that students' involvement, in the form of faculty/student interactions, is highly related to their satisfaction with college. Ory and Braskamp (1988) report that highly involved students are more apt to report high levels of intellectual skill gains. They also report that the strength of this relationship is different for different types of students.[1] Many of the forms of student involvement described in this literature are ones which academic programs in community colleges strive to facilitate.

[1] Pace (1984) reports that students' self-rated measures of skill gain are credible. This finding, and the reliance in much of the research literature on such measures, lead us to rely on similar measures in this study.

The Design of This Study:

From the literature, we identified four outcomes criteria for assessing the effectiveness of academic programs:

a) facilitating transfer to more advanced studies
b) enhancing employability
c) improving skill levels
d) achieving student satisfaction

We chose to consider several contexts which might affect those outcomes. These included how students spend their time while at college, their length of time at college, their academic achievement at college, and the proximity of their college to a B.C. university.

The data needed to address these criteria and contexts came from two sources: the survey and extracts from the students' college records. The survey for this study drew, largely, on items developed by Terenzini (1987) and Pace (1984).

Students reported, on the survey, what they went on to do after college and rated the overall worth of their studies. They also reported how much their writing, speaking, reading, problem-solving, and study skills improved while at college. They also described their levels of involvement while at college. They did so by reporting how often they:

a) found interesting things to do on campus
b) had valuable out-of-class learning experiences
c) used the campus facilities to read, study, or do research
d) met their instructors during office hours
e) did things with a group of other students
f) were intellectually stimulated by the material covered in class
and g) were attentive in class

Students also rated the quality of instruction and their out-of-class experiences. Lastly, they compared that quality to the quality of their experiences at their prior, and subsequent, institutions.

Six colleges participated in this study. They were a mix of college types. Two of the participating colleges were colleges from the Interior regions of the province, and located far from the B.C. universities. One was a college located within commuting distance of the University of Victoria. The other three were Lower Mainland colleges located within commuting distance of Simon Fraser University, or the University of B.C., or both. The sizes of the academic programs at these colleges ranged from the largest in the province to one of the smallest.

Response Rates:

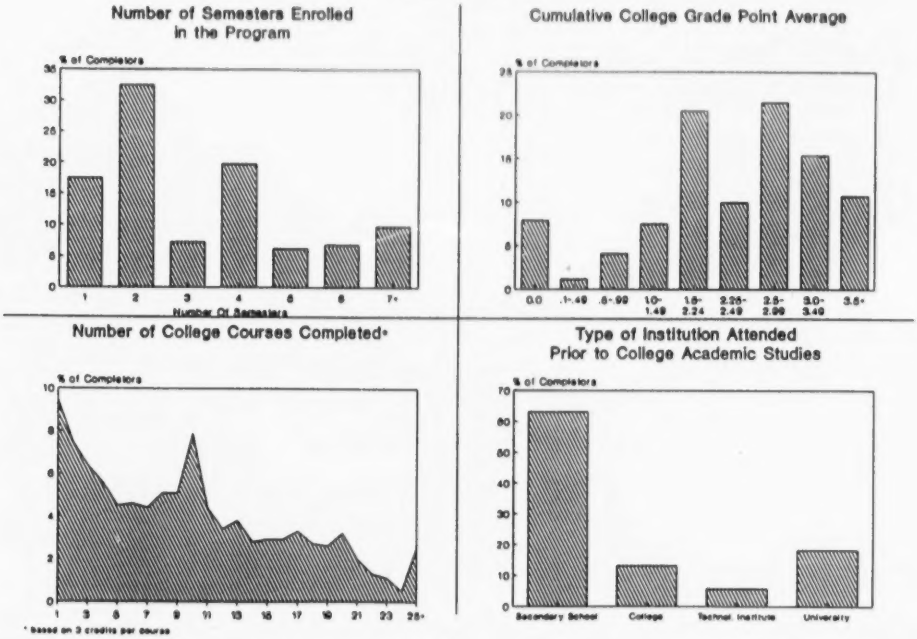
Each college surveyed all their academic students who had completed the January 1987 term and who had, by January 1988, not since returned to their college studies. Each college surveyed its own former students using the same survey form. All colleges used two mailings. Some supplemented their mailings with telephone follow-ups. Response rates, by college, ranged from 23% to 46%, and averaged 32%. The survey results from each college were pooled along with corresponding demographic data on each student.

Tests for response bias found some statistically significant differences between respondents and non-respondents. In most instances, these differences did not have a major influence on the survey results.[2]

Some Features of Students Who Complete College Academic Studies:

The students who completed the January 1987 term were an eclectic group. Many attended for only one term. Over one-third of them were enrolled in some other post-secondary institution before starting their college academic studies. Over half earned less than one full-year of college credit. Less than 60% qualified for admission to a university based on their college grades (see Figure 1). On average, these students completed fewer than three college courses per term. They were predominantly part-time students.

FIGURE 1



[2] students with high GPA's and students whom earned a high number of college credits were more prone to respond than others. Although the effects of this bias on most of the data were not large, we choose to compensate for it with weighting procedures.

Colleges differed significantly in their mix of these student types. The percentage of these students who attended for only one term ranged from 9.5% at one college to 26.2% at another. The percentage who earned the equivalent of one and a half years of college credit (or more) ranged from 17.5% at one college to 33.7% at another.

The Outcomes:

1) Transfer Rates:

The academic programs in B.C.'s colleges enable the transfer, to university, of students who cannot afford, or qualify for, direct entry to a university. A recent government analysis concluded that, for the institutions participating in this study, less than 40% of the academic students transfer to a B.C. university. Of the former students we surveyed, 44% transferred to a B.C. university.

The first reason that university transfer rates are not higher is that some important factors influence the comparison base and are not normally controlled for:

a) out-of-province transfers;
b) transfer intentions;
c) academic eligibility to transfer; and
d) the number of credits earned at college.

When we added in students who transferred to a university located out-of-province, the university transfer rate rose slightly to 49%. Next, we eliminated from this rate those students who said that they had no intention of transferring to a university. The transfer rate rose to 63%. Next, we limited this rate to only those who earned a college Grade Point Average sufficient to qualify for admission to a BC university. The transfer rate rose, further, to 78%. The effects of each of these adjustments, by college, are shown in Figure 2. Lastly, we weighted this data based on the number of credits earned at our colleges. This was done to compensate for the large numbers of part-time students who earn less than one year of college credit before transferring.[3] Here, again, the university transfer rate rose -- to 84%.

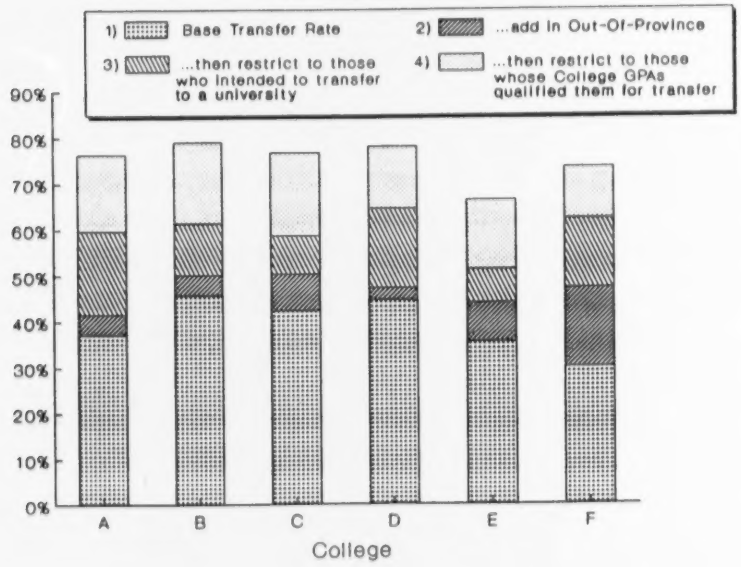
The impact of each of these adjustments differed between colleges. Out-of-province transfers most increased the university transfer rates of colleges located well away from the major metropolitan centres where the BC universities are located (i.e., Colleges 'E' and 'F'). Removing students who did not intend to transfer increased university transfer rates most at two of the metro colleges (Colleges 'A' and 'B'). Academic eligibility to transfer mostly affected university transfer rates at the other two metro colleges (Colleges 'B' and 'C').

[3] many of whom, in the metropolitan Vancouver (Lower Mainland) area, are 'university remediators' -- ie take one or two college courses to pick up credits which they failed at a university prior to returning to university.

FIGURE 2

The Effects of Adjustments on Students' University Transfer Rates

by College

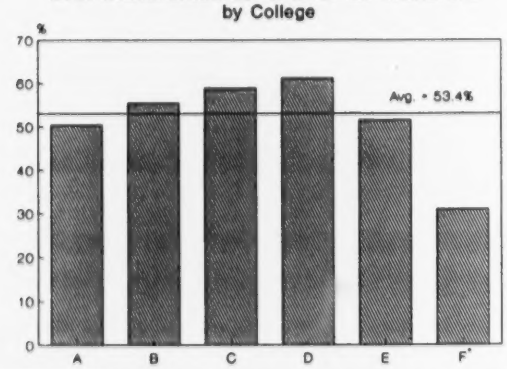


The second reason university transfer rates, as traditionally calculated, are not higher is that many students choose, instead, to transfer to other types of institutions. Gilbert and Gomme (1986) speculate that many of those who leave universities may be scholastically capable students who have transferred to another institution.[4] We speculated that the same was true for college academic students who do not transfer to a B.C. university. Our results confirm this. Transfers to B.C. universities accounted for only 53% of all the transfers which occurred in the year after college (see Figure 3). Inter-college transfers and transfers to the B.C. Institute of Technology accounted for most of these non-university transfers.

FIGURE 3

B.C. Universities as a % of all Transfers

by College



* Other main institutions are Alberta Universities (10.1%), BC Instit. of Technology (10.0%), and Douglas College (7.4%). Note that these rates are based on a small N.

[4] see Gilbert, S.N. and Gomme, I.M., "Future Directions in Research on Voluntary Attrition From Colleges and Universities in College and University, 61(3), p235. They also cite Pascarella, Duby, and Iverson (1983).

2) Employability:

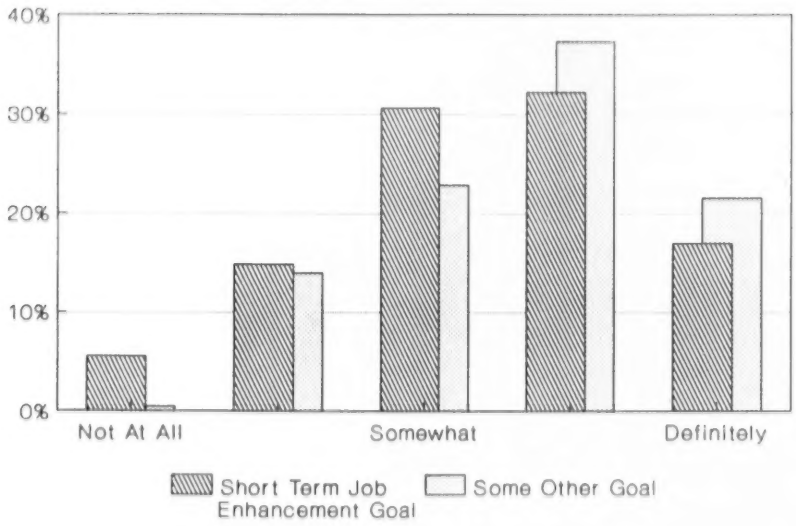
Canadian labour force statistics historically show that groups with the highest levels of post-secondary education have the lowest unemployment rates. Enhanced employability has become an anticipated outcome of any post-secondary program--including academic programs.

Our findings suggest that academic studies improve students' employability more in the long-term, than in the short-term. They also show that this conforms to students' expectations. In the short-term (ie the twelve months following their completion of academic studies at a college), most students reported that the jobs they obtained were not related to their studies, and over 75% said their studies did not help them to get a job.[5] Most (60%) said their academic studies had been of no help in performing their job tasks. These outcomes were not surprising to the students--less than 10% of the students we surveyed had short-term employment-related reasons for taking their academic studies.[6]

With a longer-term perspective, enhanced employability is more apparent. Most students (80%) believe that the skills they acquired through their academic studies will enhance their careers. This is less the case for students who began their studies with a short-term job enhancing goal than for others (see Figure 4).

FIGURE 4

Extent of Career Enhancement by Student's Original Goals



[5] note that none of these students received any credential upon completion of their college academic studies. This may have some effect on employers' propensities to place added value on applicants with such education.

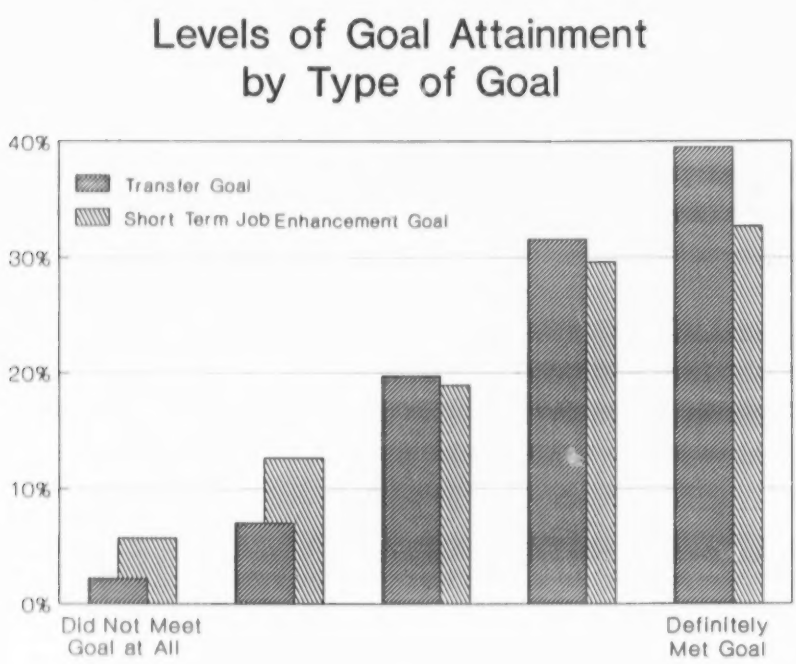
[6] nevertheless, (for those who insist on some short-term employment-related benefit!) we found that the unemployment rate of these former students was significantly lower one year after college than the prevailing labour force unemployment rate. The unemployment rate for 18-24 year olds in 1987 was 13.7%; of these former students, only 4.3% were unemployed when contacted.

3) Satisfaction:

The cost of attending college is significant. Many students invest a substantial amount of time and money in their studies. Their perceptions of how worthwhile their studies were, therefore is, an important outcome measure.

Most students report that they would recommend our colleges to a friend, and most (92%) say their studies at our colleges were worthwhile. Also, most say they met their original objective for enrolling in academic studies. This was slightly more the case for those who entered their academic studies with transfer-related goals than for those who sought was to improve their short-term job prospects (see Figure 5).

FIGURE 5

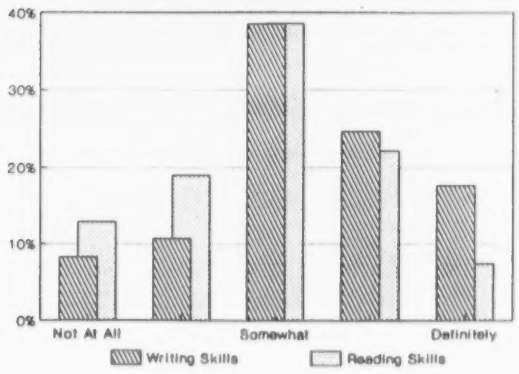


4) Self-Reported Skill Gains:

Academic programs seek to impart knowledge and develop intellectual skills. In this study, students rated the extent of their skill development in several areas: writing, speaking, reading, problem-solving, and studying. Most students (92%) reported that, overall, their skills had improved to some extent while at college. Students believe that their greatest skill gains were in written communications and study skills. Lower skill gains were in reading and oral communications skills (see Figure 6).

FIGURE 6

Extent To Which Students Say That They Aquired Writing and Reading Skills

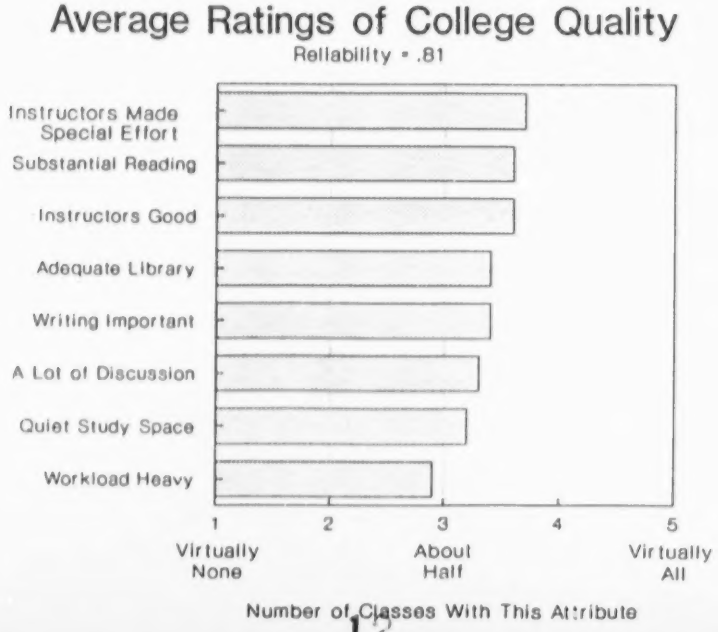


5) Evaluation of College Quality:

To facilitate program improvements, we need to know whether students' experiences at our colleges are of high quality. The research literature identifies several experiences which are intrinsic to high quality academic programs. Students rated their own exposure to some of those things, including classes that required substantial writing, classes taught by excellent instructors, and classes supported by adequate library materials.

Students reported that their experiences in the program were of high quality. Most often, they encountered the special efforts of instructors to be available for individual help and substantial reading requirements. They encountered, least often, heavy course workloads and quiet study space when they needed it (see Figure 7).

FIGURE 7



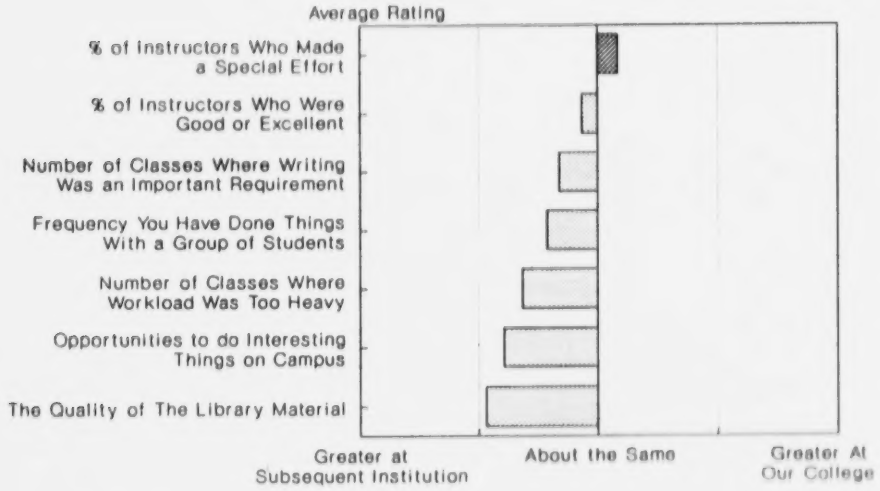
Students compared some of these same aspects of their studies at our colleges to their experiences at the institutions they have since gone on to. They painted a less rosy picture of the quality of their college experiences. They believe that their experiences at college were slightly better than before college; however, their experiences at their subsequent institution have been that much better.[7]

Specifically, students said that their subsequent institutions have superior library materials, more opportunities to do interesting things on campus, and heavier workloads. Their comparisons favoured our colleges on only one item -- the special efforts of instructors to be available for individual help (see Figure 8).

FIGURE 8

Comparative Ratings of Quality of Educational Experiences

Reliability = .94


Average Rating
% of Instructors Who Made a Special Effort
% of Instructors Who Were Good or Excellent
Number of Classes Where Writing Was an Important Requirement
Frequency You Have Done Things With a Group of Students
Number of Classes Where Workload Was Too Heavy
Opportunities to do Interesting Things on Campus
The Quality of The Library Material
Greater at Subsequent Institution
About the Same
Greater At Our College

What Affected Outcomes?

To pinpoint areas for program improvement, we tested the data to find what affected each outcome. We used multiple regression procedures for the statistical analysis.

The analysis included these variables as potential predictors of each outcome:

a) students' ages
b) full vs. part-time studies at college
c) gender
d) number of semesters attended at college
e) number of credits earned at college

[7] we were concerned that these comparative ratings might be the results of a general tendency for students to always rate highest the institution they had attended most recently. We tested the data to see if it was influenced by such a 'haloing effect'. It was. However, the impact of this 'halo effect' on the results was relatively insignificant (around 5%).

f) College Grade Point Average
g) specific college attended
h) was the college attended in an area served by a B.C. university
i) students' ratings of college quality
j) quality of their educational experiences before college[8]
k) student involvement in various aspects of college life

The results produced a list of the variables which accounted for most of the variance in each of the outcomes measures.[9] Table 2 summarizes the relationships we discovered.

TABLE 2: PREDICTORS OF MAJOR OUTCOME VARIABLES

MAJOR OUTCOME VARIABLE	VARIANCE ACCOUNTED FOR(*)	PREDICTOR VARIABLES IN MULTIPLE REGRESSION EQUATION (stepwise method)	Variance in Predictor That is Reliable (**)
Transfers	18.0%	TOTAL FOR 5 VARIABLES IN EQUATION	
	8.5%	Cumulative Credits	
	4.0%	Age	
	3.2%	Cumulative GPA	
	1.6%	Quality of Educational experience at subsequent institution	(88%)
	0.7%	College Program Quality	(66%)
Employability	32.9%	TOTAL FOR 5 VARIABLES IN EQUATION	
	20.8%	Reported Skill Gains	(62%)
	6.6%	Overall College Satisfaction	(71%)
	2.0%	Studies Related to Job	(90%)
	2.8%	Age (***)	
	0.8%	Involvement at College	(61%)
Reported Skill Gains	30.8%	TOTAL FOR 4 VARIABLES IN EQUATION	
	21.7%	Overall College Satisfaction	(71%)
	6.0%	Involvement at College	(61%)
	1.9%	Quality of Educational experience at previous institution	(66%)
	1.3%	Studies Related to Job	(90%)
Overall College Satisfaction	44.1%	TOTAL FOR 6 VARIABLES IN EQUATION	
	24.9%	Involvement at College	(61%)
	6.2%	Reported Skill Gains	(62%)
	4.4%	Cumulative GPA	
	4.1%	College Program Quality	(66%)
	3.1%	Age	
	1.4%	Quality of Educational experience at previous institution	(66%)

* Variance Accounted for is equal to the correlation squared times 100, and is referred to at the coefficient of determination in some publications.

** Percent of total variance that was found to be reliable using Chronbach alpha procedure (Chronbach alpha coefficient squared times 100). Reliabilities can not be computed for single items or indices like G.P.A.

*** The age distribution of the population was quite skewed. This, plus the inherent reliability of age variables, account for the discontinuity in the ordering of the stepwise results.

[8] defined as the sum of students' ratings of their social involvement in activities, the quality of instructors, and the workload expected of them by their previous institution.

[9] all demographic and survey measures were allowed to enter the equations, using stepwise procedures. This method produces an ordered list of the variables which most predict additional variability in each outcomes measure without overlapping with the variability explained by other variables in the list. This procedure does not consider possible interactions among the predictor variables. Nevertheless, it describes the main effects of the predictor variables.

None of the outcomes were affected by the students' gender, the location of their college, the specific college they attended, whether or not students were subsequently employed, nor the students' number of semesters in the program. In addition, while students' transfers to other institutions obviously affect transfer rates, such transfers did not affect any of the other outcomes. Those who did not transfer were just as likely as those who did to report skill gains, enhanced employability, and satisfaction with the worth of their studies.

We treated transfer as a dichotomous variable in the analysis. The population was divided into those who transferred into further post-secondary studies, and those who did not. The results show that transfer was related to five variables. The overall number of credits a student attained at college accounted for the largest portion of the explained variance -- the greater the number of credits, the greater the propensity to transfer. Students' age and Cumulative Grade Point Average (GPA) were also positively related to transfer -- older students with high GPA's were most prone to transfer. Two small, but significant, influences were exerted by the quality of students' educational experiences at subsequent institutions and the overall quality of their program at college[10].

For an employability outcome, we predicted variance in a single variable -- the extent to which students said their long term career prospects were enhanced by their studies. Five variables accounting for 33% of the variance in this measure of employability. Another outcome -- reported skill gains[11] -- accounted for two thirds of that variance. When skill gains and another outcome -- students' satisfaction with their college experience[12] -- are combined, over 80% of the explainable variance is accounted for. Age and the relatedness of their studies to their job, accounted for most of the rest . Students' involvement at college[13] also accounted for a small, but significant, portion of the variance.

For skill gains, we predicted variance in the sum of students' self-reported gains on all five cognitive skills. Four variables account for roughly one third of the explainable variance in this summed measure of skill gain. Another outcome -- students' satisfaction with their college experience -- was the most important predictor. Involvement at college, the quality of students' educational experience at their previous institution and the relatedness of their studies to their current job, accounted for the rest of the explained variance.

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[10] high quality being defined, in our analyses, as having, for all classes: substantial reading requirements, writing as an important component, heavy workloads, instructors who were good or excellent, substantial classroom discussion, quiet study space when needed, adequate library materials, and instructors who made a special effort to be available for individual help.

[11] In this, and all other regression analyses, we used the sum of each student's self-reported gains on all five cognitive skills (writing, reading, speaking, problem-solving, and study skills). Sixty-two percent of the variance in this summed measure of skill gains is reliable.

[12] In this, and all other regression analyses, we used a sum of the students ratings on two questions: the overall worth of their studies, and their propensity to recommend the program to a friend. Seventy-one percent of the variance in this summed measure is reliable.

[13] In this, and all other regression analyses, we summed each student's ratings of the seven involvement-related items listed on page 3 above. Sixty-one percent of the variance in this summed measure is reliable.

For a satisfaction outcome, we used the sum of student's ratings to two questions: the overall worth of their studies, and their propensity to recommend the program to a friend. Six factors explained roughly 44% of the variance in this satisfaction outcome. Interestingly, students' involvement in various aspects of college life, accounted for over half of the explained variance. Skill gain, GPA, the quality of the program at the college, and age account for most of the remaining explained variance. The quality of educational experience at the students' previous institution accounts for a small, but significant, portion.

These results imply that the outcomes this study measured are not mutually exclusive. That is, successful outcomes in one area are related to successful outcomes in other areas. Skill gain, college satisfaction and involvement all appeared to have some shared pool of variance.

These results also imply that students' involvement in college life has a significant positive relation to both their skill gains and their satisfaction. This finding further supports Terenzini's (1987) conclusion that involvement is an important factor in students' achievement of skill gain. The influence of involvement on students' skill gains was slightly weaker than Terenzini (1987) reports for students at SUNY-Albany.[14] This finding also supports Astin's finding that some forms of involvement are highly associated with students' satisfaction with college.[15]

In more detailed analyses, we found that differences in student involvement were significantly more important than any of the other differences we examined in explaining inter-college differences in outcomes. Figure 9 shows the relationship of student involvement to each outcome. It also illustrates how, more than other variables, levels of involvement differentiate rates of successful outcomes. The significance of these data is that each of the six colleges differed in their mix of student types. We found that these differences were more significant than the college attended in explaining inter-college differences in outcomes.[16]

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[14] for the statistically literate, Terenzini (1987) reports a Beta value of .32 in testing the relationship between skill gains and involvement. We tested this same relationship using some of the same questions to construct our involvement scores. We achieved similar (but slightly lower) Beta value of .26. Note, however, that when we replicated the analysis on unweighted data we achieved a Beta of .35 (slightly higher than Terenzini's). We believe the difference between our weighted and unweighted results (and their corresponding differences from Terenzini's results) is because we included, in our sample, students who earned a college Grade Point Average of 0.00. Few of these students responded. By compensating for this lack of response, our weighting procedure may have masked the stronger relationship between skill gains and involvement when the population is restricted to students who have achieved some measure of academic success at college. We were unable to confirm or disprove this suspicion with the data used in this study.

[15] Astin, A.W., Four Critical Years: Effects of College on Beliefs, Attitudes, and Knowledge, San Francisco: Jossey-Bass, 1977, as cited in Ory and Braskamp (1988).

[16] as part of this analysis, we divided the population into four student types: young full-time, young part-time, old full-time, and old part-time. The splits were made based on those who were younger than 22 years old (classified as 'young'), and those who earned an average of more than 9 credits per semester attended (classified as 'full-time'). As a descriptor of college type, we divided the population into those who attended a college in the interior of the province and those who attended a metropolitan college. We predicted variance in student satisfaction using these two variables (ie student type and college type). College type accounted for 1% of the explainable variance. Student type accounted for significantly more (8%).

FIGURE 9

Comparing the Effects of Involvement and Some Other Variables on Student Outcomes

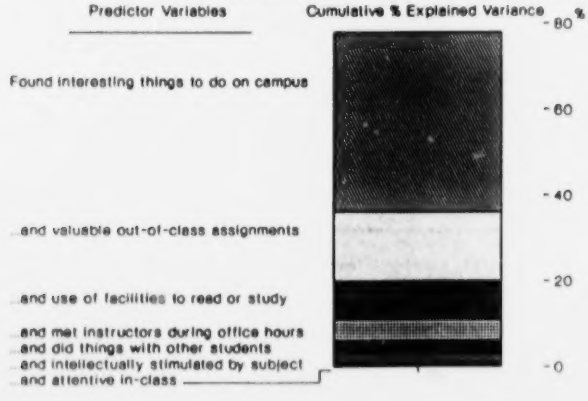
	% Transferred to a B.C. University	% Transferred Anywhere	% Rating as Career Enhancing	% Some or Substantial Skill Gains	% Valuable
a) Grade Point Average					
* 0.00-1.49	7.3	32.8	63.8	52.9	75.1
* 1.50-2.24	26.6	56.3	78.1	61.6	85.4
* 2.25-2.99	60.0	62.9	82.2	69.7	95.8
* 3.00+	50.9	64.2	86.8	64.8	95.9
b) Number of Semesters					
* 1 semester	14.4	37.3	72.7	47.1	82.9
* 2 semesters	35.7	59.5	74.2	58.3	85.0
* 3 semesters	32.4	50.2	69.6	65.6	93.1
* 4 or more semesters	52.7	67.9	87.4	72.9	94.9
c) Number of Courses Completed					
* less than 3 courses	10.3	36.3	73.8	49.4	87.5
* 3.1 to 8.0 courses	22.9	52.4	73.0	59.1	81.1
* 8.1 to 14.0 courses	56.0	71.8	79.4	66.6	92.5
* more than 14 courses	64.9	75.1	89.6	75.8	97.0
e) Involvement					
* very low involvement	18.1	51.1	36.9	24.1	46.7
* low involvement	33.1	57.9	72.0	43.4	82.5
* high involvement	45.8	60.8	86.5	76.9	97.2
* very high involvement	46.5	62.0	93.7	90.6	99.0

The extent of student involvement, as measured in this study, is most accounted for by the frequency with which students found interesting things to do on campus (see Figure 10).[17] This, in turn, was the one aspect on which students most preferred their subsequent institution over our colleges.

FIGURE 10

Predictors of Students' Levels of Involvement

(Reliability = .78)



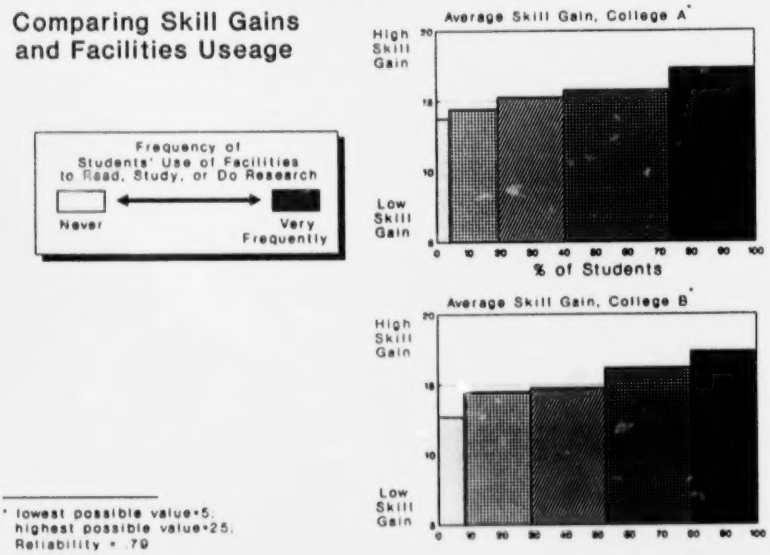
[17] It accounted for over 40% of the variance in student involvement scores

This leads us to our first digression. If students are more able to find interesting things to do on campuses other than ours, could this relate to the comparative resources our colleges have with which to create a sense of out-of-class campus life? We explored one aspect of this question. We compared the involvement and skill gains ratings from two of the participating colleges. Students from College 'A' were slightly more involved than students from College 'B'. Campus facilities at College 'A' are among the finest available in the province in terms of the mix of instructional and support space. By contrast, College 'B' is overcrowded, with limited support space (such as study space).

We compared students' answers to facility related questions for these two colleges.[18] Their answers were significantly different between the two colleges ($F=72.3$ $df=690$ $p<.01$). Students from College 'A' reported greater use of campus facilities than those from College 'B'. When differences in student demographics were statistically held constant, 10.24% of the variability in students' use of facilities was explained by knowing which college they attended.[19] This difference accounted for roughly one-fifth of the reliable variability in these colleges' facilities scores. This is a substantial impact.[20]

Figure 11 illustrates the importance of this finding in explaining differences between the two colleges in students' rates of skill gain. At both colleges, skill gains are greatest for students who used the facilities most often. College 'A', however, had a significantly higher percentage of students who used the facilities frequently or very frequently.

FIGURE 11


Comparing Skill Gains and Facilities Useage
Frequency of Students' Use of Facilities to Read, Study, or Do Research
Never
Very Frequently
Average Skill Gain, College A*
High Skill Gain
Low Skill Gain
% of Students
Average Skill Gain, College B*
High Skill Gain
Low Skill Gain
* lowest possible value=5; highest possible value=25. Reliability = .79

[18] the four items that related to facilities were: how frequently did you find interesting things to do on campus; how frequently did you use the campus facilities to read, study, or do research; How often could you find quite study space when you wanted it; and how many of your classes had adequate library materials. The average for all four items was greater at College 'A' than at College 'B'. These items were combined into a facility score. The result was reasonably reliable. It produced a Chronbach Alpha of .71, meaning that about half of the variability in comparative facilities scores was reliable.

[19] this relationship was determined using analysis of covariance.

[20] a limitation of this finding is that the survey was not focused on facilities issues (it contained only four items related to facilities).

Writing skills across the curriculum is a policy issue at a number of B.C. colleges. This issue lead us to our second digression. We tested the data to determine what variables accounted for variances in students' self-reported writing skill gains. This analysis was done on the data for one college.[21]

For that college, the key predictor was improved oral communications skills (they accounted for over 25% of the variance in writing skill gains). Oral communication was also one of the skills on which students reported their smallest skill gains for that college. It was also an area where students who went on to other institutions specifically rated that other institution higher than the college. Many students specifically suggested that the college modify course delivery methods to enable more classroom discussion of class material.

Implications:

There are four implications of these findings.

First, follow-up studies of college academic students can produce reliable outcomes measures. Those measures, parenthetically, reflect favourably on the effectiveness of college academic programs. This is particularly true when outcomes are measured in the contexts of the types of students served. Most students (58%) continue their studies at another post-secondary institution after leaving our colleges. The transfer rate to universities is highest (84%) when controlled for the number of credits earned, students' original intentions to transfer, and their eligibility to transfer. Most students (80%) reported their careers have been enhanced by college-based academic studies. Most (92%) say they improved their basic skills. Most (92%) reported that their academic studies were worthwhile and rate the quality of our programs highly.

Second, these results confirm that students who are highly involved at college are more prone than others to achieve high levels of skill gain. These results also extend this finding in two ways:

a) student involvement affects more than merely skill development; and

b) much university-based research on the forms and influences of involvement applies equally well to community colleges.

Many students, in their open-ended comments, confirmed both of these extensions.

Third, underlying these results are specific relationships between campus climate, student involvement, and student outcomes which can enable program improvement. For the colleges in this study, the creation of additional non-classroom space and movement toward more tutorial forms of instruction were

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[21] a college at which writing skill gains accounted for 10.5% of the variance in students' overall skill gains scores.

two policy recommendations inferred from these statistical relationships. Both of these findings were also reinforced by the students' open-ended comments.

Fourth, these results confirmed that different colleges serve different types of students and different types of students have different rates of post-college success. Comparative data, such as that produced by this study, can help clarify inter-college differences in student outcomes and the reasons for those differences. This, in turn, can help collaborating colleges identify the opportunities for program improvement more clearly.

Vancouver Community College
Office of Institutional Research
April 24, 1989
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